

FAST-NEUTRON INTERACTIONS WITH  $^{182}\text{W}$ ,  $^{184}\text{W}$  and  $^{186}\text{W}^{*+}$

by

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ABSTRACT

Neutron total cross sections of  $^{182}\text{W}$ ,  $^{184}\text{W}$  and  $^{186}\text{W}$  are measured from  $\approx 0.3 - 5.0$  MeV at intervals of  $\lesssim 50$  keV to accuracies of 1 - 3%. Differential neutron elastic- and inelastic-scattering cross sections of the same three isotopes are measured at scattering angles in the range 20 - 160 deg. and at incident-neutron energy intervals of  $\approx 100$  keV from 1.5 - 4.0 MeV. Approximately thirty scattered-neutron groups are observed for each of the isotopes. Prominent of these are excitations attributed to collective rotational and vibrational bands. The experimental results are interpreted in terms of optical-statistical and coupled-channels models with particular attention to the direct excitation of ground-state-rotational and  $\beta$ - and  $\gamma$ -vibrational bands. The strengths of the direct interactions and the magnitudes of the collective deformations are inferred from the interpretations and compared with similar values previously reported elsewhere. The experimental results are used to deduce experimentally-based evaluated data sets for  $^{182}\text{W}$ ,  $^{184}\text{W}$  and  $^{186}\text{W}$  over the energy range 0.1 -  $\approx 5.0$  MeV.

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Keywords: Nuclear Reactions: Measured  $\sigma_n(\text{total})$  of  $^{182}\text{W}$ ,  $^{184}\text{W}$ ,  $^{186}\text{W}$ , 0.3 - 5.0 MeV; Measured  $d\sigma/d\Omega_n$  (elastic and inelastic) 1.5 - 4.0 MeV, 20 -160 deg.; Optical-statistical and coupled-channels model interpretations.

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